Figure 1

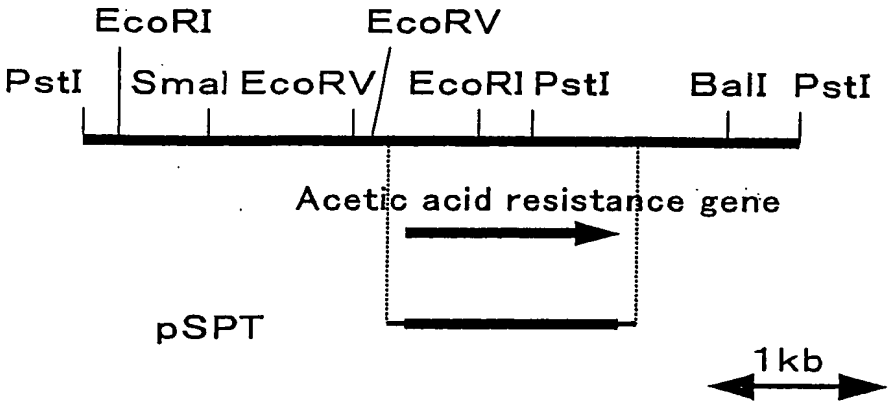


Figure 2

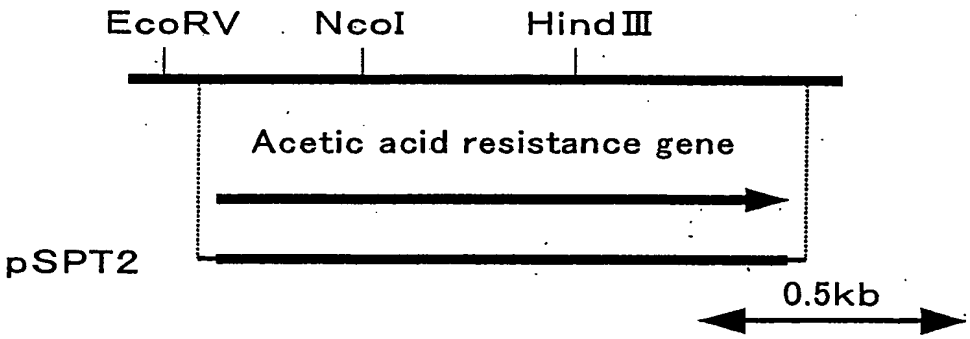


Figure 3

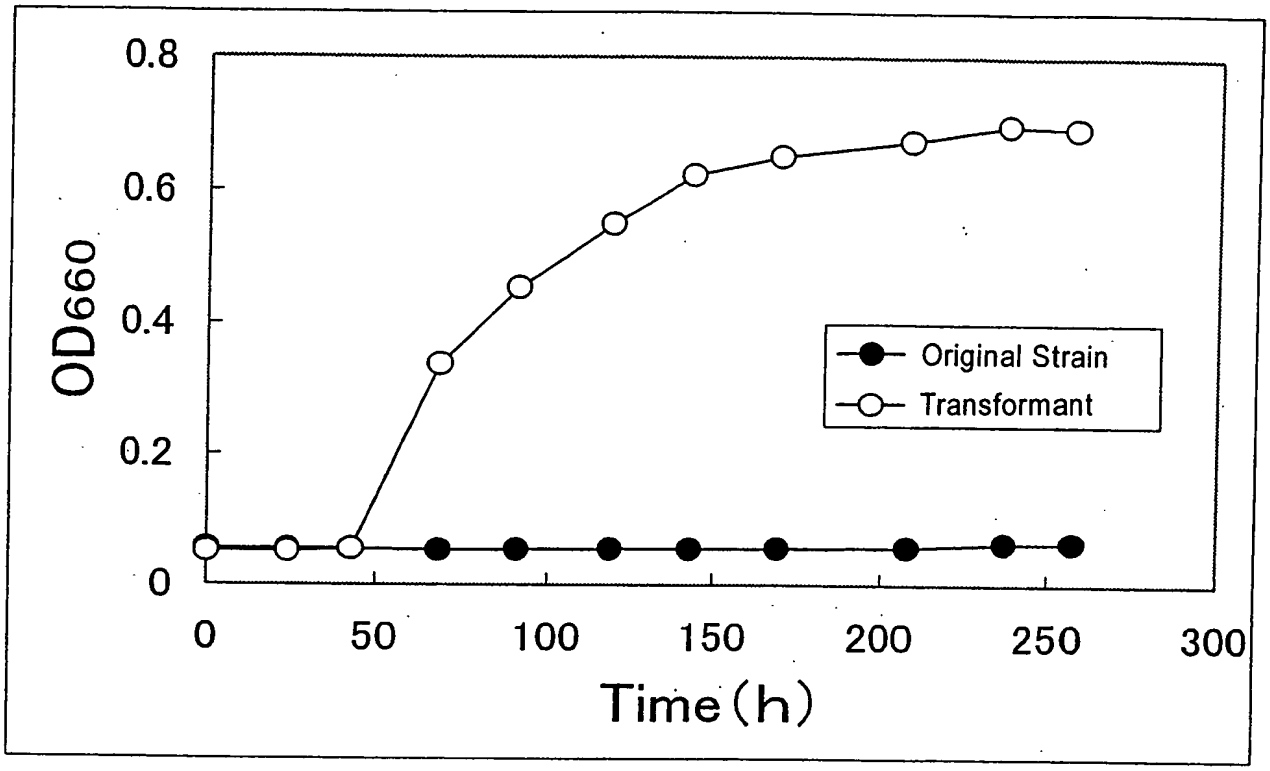
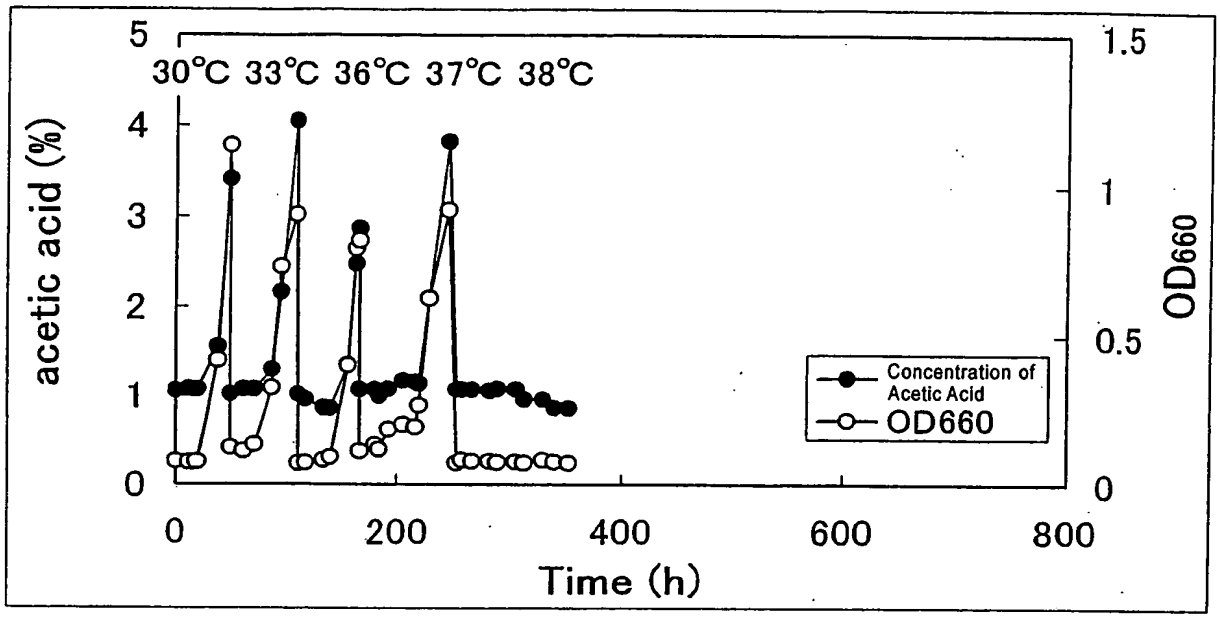

0.8
0.6
0.4
0.2
0
OD660
0
50
100
150
200
250
300
Time (h)
Original Strain
Transformant

Figure 4

Fermentation Process of Original Strain



Fermentation Process of Transformant

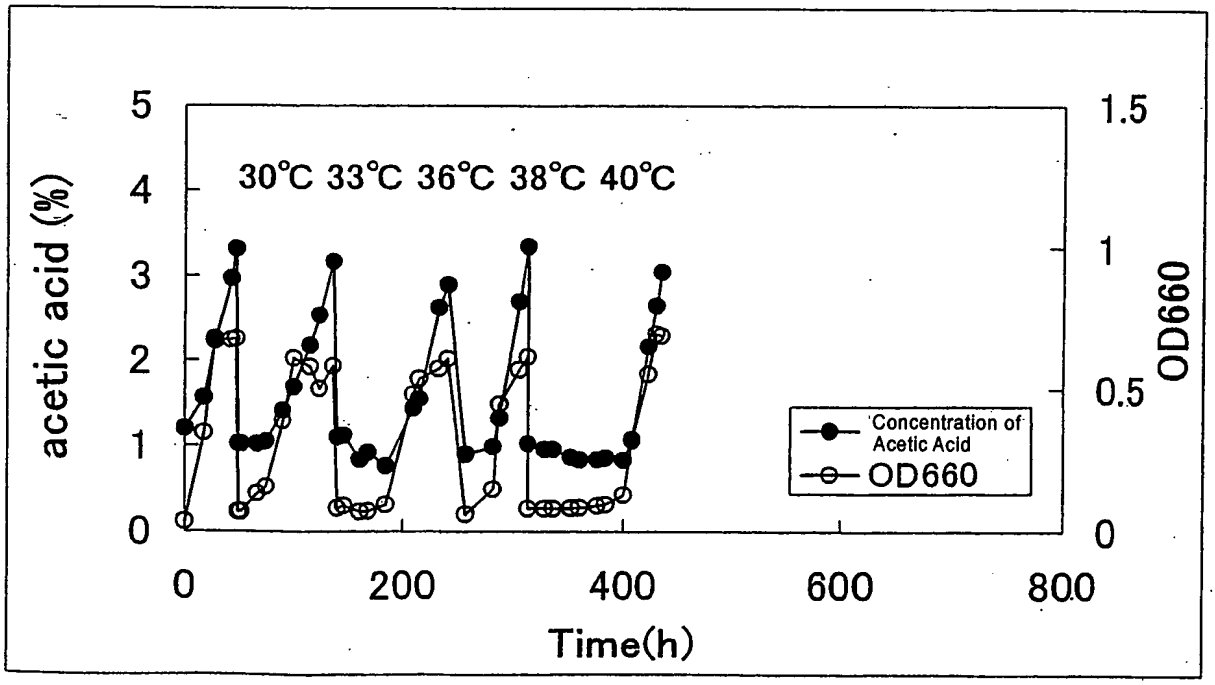


Figure 5

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MetSerIlePheSerLysTyrGluGlyLeu AlaSerAlaLeuSerAlaValThrAlaAsp      20
GlyGlyArgAsnProPheAsnValValIle GluLysProIleSerSerThrValGlyLeu      40
IleGluGlyArgGluThrLeuLeuPheGly ThrAsnAsnTyrLeuGlyLeuSerGlnSer      60
ProAlaAlaIleGluAlaAlaValGluAla AlaArgAlaTyrGlyValGlyThrThrGly      80
SerArgIleAlaAsnGlyThrGlnGlyLeu HisArgGlnLeuGluGluArgLeuCysThr     100
PhePheArgArgArgHisCysMetValPhe SerThrGlyTyrGlnAlaAsnLeuGlyThr     120
IleSerAlaLeuAlaGlyLysAspAspTyr LeuLeuLeuAspAlaAspSerHisAlaSer     140
IleTyrAspGlySerArgLeuGlyHisAla GlnValIleArgPheArgHisAsnAspAla     160
AspAspLeuHisLysArgLeuArgArgLeu AspGlyThrProGlyAlaLysLeuValVal     180
ValGluGlyIleTyrSerMetMetGlyAsp ValValProMetAlaGluPheAlaAlaVal     200
LysArgGluThrGlyAlaTrpLeuLeuAla AspGluAlaHisSerValGlyValMetGly     220
GluHisGlyArgGlyValAlaGluSerAsp GlyValGluAspAspValAspPheValVal     240
GlyThrPheSerLysSerLeuGlyThrVal GlyGlyTyrCysValSerAsnHisAlaGly     260
LeuAspLeuIleArgLeuCysSerArgPro TyrMetPheThrAlaSerLeuProProGlu     280
ValIleAlaAlaThrMetAlaAlaLeuThr GluLeuGluAsnArgProGluLeuArgVal     300
ArgLeuMetAspAsnAlaArgArgLeuHis AspGlyLeuGlnAlaAlaGlyLeuArgThr     320
GlyProGlnAlaSerProValValSerVal IleLeuAspAspValAlaValAlaValAla     340
PheTrpAsnArgLeuLeuAspLeuGlyVal TyrValAsnLeuSerLeuProProAlaThr     360
ProAspGlnHisProLeuLeuArgThrSer ValMetAlaThrHisThrProGluGlnIle     380
AspArgAlaValGluIlePheAlaValVal AlaGlyGluMetGlyIleAsnArgAlaAla     400
```

Figure 6

MetThrSerLeuPheSerLysPheGluGly ThrAlaGlyAlaLeuGlySerValValAla 20

ValGlyGlyArgAsnProPheAlaValVal IleGluLysProValSerSerThrValGly 40

IleIleGluGlyArgGluThrLeuLeuPhe GlyThrAsnAsnTyrLeuGlyLeuSerGln 60

SerLysAsnAlaIleGlnAlaAlaGlnGln AlaAlaAlaAlaCysGlyValGlyThrThr 80

GlySerArgIleAlaAsnGlyThrGlnSer LeuHisArgGlnLeuGluLysAspIleAla 100

AlaPhePheGlyArgArgAspAlaMetVal PheSerThrGlyTyrGlnAlaAsnLeuGly 120

IleIleSerThrLeuAlaGlyLysAspAsp HisLeuPheLeuAspAlaAspSerHisAla 140

SerIleTyrAspGlySerArgLeuSerAla AlaGluValIleArgPheArgHisAsnAsp 160

ProAspAsnLeuTyrLysArgLeuLysArg MetAspGlyThrProGlyAlaLysLeuIle 180

ValValGluGlyIleTyrSerMetThrGly AsnValAlaProIleAlaGluPheValAla 200

ValLysLysGluThrGlyAlaTyrLeuLeu ValAspGluAlaHisSerPheGlyValLeu 220

GlyGlnAsnGlyArgGlyAlaAlaGluAla AspGlyValGluAlaAspValAspPheVal 240

ValGlyThrPheSerLysSerLeuGlyThr ValGlyGlyTyrCysValSerAspHisPro 260

GluLeuGluPheValArgLeuAsnCysArg ProTyrMetPheThrAlaSerLeuProPro 280

GluValIleAlaAlaThrThrAlaAlaLeu LysAspMetGlnAlaHisProGluLeuArg 300

LysGlnLeuMetAlaAsnAlaGlnGlnLeu HisAlaGlyPheValAspIleGlyLeuAsn 320

AlaSerLysHisAlaThrProValIleAla ValThrLeuGluThrAlaGluGluAlaIle 340

ProMetTrpAsnArgLeuLeuGluLeuGly ValTyrValAsnLeuSerLeuProProAla 360

ThrProAspSerArgProLeuLeuArgCys SerValMetAlaThrHisThrProGluGln 380

IleAlaGlnAlaIleAlaIlePheArgGln AlaAlaAlaGluValGlyValThrIleThr 400

ProSerAlaAla

Figure 7

5'—CTGGCTGCCTGTATCGTCTCTCTCAAGCAG—3'

Figure 8

5'—ACGGCTGCAGCTGGTCTTGCCGTATCT—3'

Figure 9

5'-GGCAAACCTCGGCATTATTTCCACGCTGGC-3'

Figure 10

5'-GCGAATCTGGTGTAGCCGGAGGAAGGCTG-3'

Figure 11

5'-GCCAGCGTGGAAATAATGCCGAGGTTTGCC-3'

Figure 12

5'-CAGCCTTCCTCCGGCTACACCAGATTCGC-3'